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SMITH-HILL AND BEDELL
12670 N W BARNES ROAD
SUITE 104
PORTLAND, OR 97229

EXAMINER	
MOORE, IAN N	

ART UNIT	PAPER NUMBER
2661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/847,079	TRAN ET AL.	
	Examiner	Art Unit	
	Ian N Moore	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *the application filed on 5-1-2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9 and 10* is/are rejected.

7)☒ Claim(s) *8 and 11-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 May 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "**the data path control means**" in claim 1, line 22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 1 is objected to because of the following informalities: claim 1 missing a period "." at the end. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "...**memory control means** for maintaining... and for removing the **BLOCK_IDs**... and **transmitting** them.... **the BLOCK_IDs** transmitted by **the data path control means**" in line 11. It is unclear whether BLOCK_IDs are transmitted by memory control means or the data path control means.

Claim 1 recites the limitation "**the** data path control means" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claims 2-5 are also rejected since they depend on the rejected claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Heiman (U.S. 6,735,203).

Regarding claim 1, Heiman'203 discloses an apparatus (see FIG. 5, ATM switch) for receiving and storing incoming cells derived from data transmissions conveyed on a network, and for then forwarding the cells elsewhere in the network, the apparatus comprising:

A cell memory (see FIG. 5, RST1, Resequening Memory Table 1) for sequentially receiving and storing the incoming cells in separate memory blocks (see FIG. 5, RST1 sequentially receives and stores the cell in sequential order in separate memory location/blocks (i.e. ECI0 to ECIk-1 row, and 0 to N-1 column memory block), each of the memory blocks being identified by a unique identification number (BLOCK ID) (see FIG. 5, serial number SN, 0 to N-1, is the column location number in the memory; see col. 7, lines 3-40), and for thereafter reading out a cell stored in any one of the memory blocks (see FIG. 5, A6; a cell is read from the RST1 memory table) when its BLOCK ID is transmitted to the cell memory (see FIG. 5, A4 and A5; when serial number of the each cell is transmitted to the RST1 memory; see col. 9, lines 45-67);

queuing means (see FIG. 5, Check Unit CU) for sequentially generating BLOCK IDS of memory blocks storing cells (see FIG. 5, SN0, SN1,... and ECI0, ECI1,....; note that the sequence number from CU is sequentially stores by the serial numbering unit) to be read out

of the cell memory (see FIG. 5, an SN number is used to read the cell from the RST1 memory); see col. 7, lines 15-41; and

memory control means (30) (see FIG. 5, a combined system of check unit CU, Serial number unit PSN and a read unit SU) for maintaining a BLOCK ID queue (see FIG. 5, the combined system maintains a serial number queue/table T2), for adding BLOCK IDs generated by the queuing means to the BLOCK ID queue in an order in which they are generated by the queuing means (see FIG. 5, each SN number generated by the CU is added to the numbering queue/table T2), and for removing BLOCK IDS from the BLOCK ID queue and transmitting them to the cell memory in an order in which the BLOCK IDS were added to the BLOCK ID queue (see FIG. 5, each SN number in the numbering queue/table T2 is removed/extracted, the same order as they were added, by the Read Unit SU and transmits the SN number to RST1) such that the cell memory reads out the cells stored in the memory blocks identified by the BLOCK IDS transmitted by the data path control means (see FIG. 5, A4, A5 and A6; note that RST1 reads out the cells stored in the memory locations serial number 0 to serial number N-1 via A6 upon receiving the SN number via A4 and A5 (i.e. A4 and A5 sends data path control serial number, thus is the data path control means); see col. 6, line 11 to col. 8, lines 20, see col. 9, lines 46 to col. 10, lines 9).

Regarding claim 2, Heiman'203 discloses first buffer means (see FIG. 5, Output Buffer, OB, FIFO) for storing cells out of the cell memory (see FIG. 5, RST1 memory), and for thereafter reading out and forwarding cells has stored (see FIG. 5, cell out; the stored cells in OB FIFO is read and forwarded/outputted/transmitted; see col. 7, lines 25-32.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 3,6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heiman'203 in view of Wills (U.S. 6,011,779).

Regarding claim 3, Heiman'203 discloses wherein the first buffer means and wherein the memory control means successively removes BLOCK IDs from the BLOCK ID queue and transmits them to the cell memory, and whenever the BLOCK ID queue contains at least one BLOCK ID (see FIG. 5) as described in claim 1 and 2.

Heiman'203 does not explicitly disclose wherein the first buffer means produces and sends first back pressure data indicating whether a number of cells stored in the first buffer means above first threshold level, wherein refraining from removing BLOCKs/cells from the BLOCK/cell queue and transmitting whenever the first back pressure data indicates that the number of cells stored in the first buffer means is below the first threshold level.

However, the above-mentioned claimed limitations are taught by Wills'779. In particular, Wills'779 teaches wherein the first buffer means (see FIG. 6, Output Buffer 24) produces and sends first back pressure data (see FIG. 6, backpressure signal or overfill signal; see col. 6, lines 31-35) to the memory control means (see FIG. 3, Backpressure

control 14) indicating whether a number of cells stored in the first buffer means above first threshold level (see FIG. 6, Output buffer 24 sends backpressure removed signal or overfill removed signal to the backpressure control 14 when the output buffer non longer fill past the predetermined threshold, that is, when the output buffer is no longer congested/fill and the emptiness or spaces in the output buffer is above/more than predefined level; see col. 5, lines 50-61; see col. 5, lines 50 to col. 6, lines 35),

wherein the memory control means successively removes BLOCKs/cells from the BLOCK/cell queue (see FIG. 6, Input buffer 23) whenever the BLOCK/cell queue contains at least one BLOCK/cell (see FIG. 6, input buffer 23 stores the cells, thus it has at least one block/cell to transmit) and the first back pressure data indicates that the number of cells stored in the first FIFO buffer means is above the first threshold level (see FIG. 6. backpressure control 14, control interface 19; see col. 5, lines 50 to col. 6, lines 35; note that when overfill backpressure signal is removed by the backpressure control 14, the input buffer resume the transmission, and it is clear that when the transmission is resumed, the cell/block are removed from the input buffer 23, when the output buffer is no longer congested/fill and the emptiness or spaces in the output buffer is above/more than predefined level), and

wherein the memory control means refrains from removing BLOCK IDS from the BLOCK ID queue and transmitting whenever the first back pressure data indicates that the number of cells stored in the first buffer means is below the first threshold level (see col. 6, lines 5-31; when the overfill backpressure is received at the backpressure control 14 with regarding to congested input buffer 23, the cell transmission is disabled/refrained/stopped at the congested input buffer. Note that when cell transmission is disable, the cells/blocks are

not removed for the input buffer 23. Note that the output buffer is congested/fill when the emptiness or spaces in the output buffer is below/less than predefined level).

In view of this, having the system of Heiman'203 and then given the teaching of Wills'779, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Heiman'203, by providing a backpressure mechanism with overflow backpressure signal control backpressure control, as taught by Wills'779. The motivation to combine is to obtain the advantages/benefits taught by Wills'779 since Wills'779 states at col. 1, line 31 to col. 2, lines 5 that such modification would maximizes the speedy transmission of time-critical data and minimizes the loss of information-critical data by controlling the congestion).

Regarding claim 6, Heiman'203 discloses a method for receiving and storing cells derived from data transmissions conveyed on a network, and for then forwarding the cells elsewhere the network (see FIG. 1, ATM switch and its transmission on the ATM network), the method comprising the steps of:

a. sequentially receiving and writing the cells into separate blocks of a cell memory (see FIG. 5, RST1, Resequening Memory Table 1; note that RST1 sequentially receives and stores the cell in sequential order in separate memory location/blocks (i.e. ECI0 to ECIk-1 row, and 0 to N-1 column memory block), wherein each memory block identified by a unique identification number (BLOCK ID) (see FIG. 5, serial number SN, 0 to N-1, is the column location number in the memory; see col. 7, lines 3-40);

b. generating (see FIG. 5, Check Unit CU) a sequence of BLOCK IDs of memory blocks currently storing cells; see FIG. 5, SN0, SN1,... and ECI0, ECI1,....; note that the sequence number from CU is sequentially stores by the serial numbering unit; see col. 7, lines 15-41; and

c. adding each generated BLOCK ID to a BLOCK ID queue (see FIG. 5, the combined system maintains a serial number queue/table T2; see FIG. 5, each SN number generated by the CU is added to the numbering queue/table T2),

d. successively removing each BLOCK ID from the BLOCK ID queue in an order in which BLOCK IDS were added to the BLOCK ID queue (see FIG. 5, each SN number in the numbering queue/table T2 is removed/extracted, the same order as they were added, by the Read Unit SU and transmits the SN number to RST1) whenever the BLOCK ID queue contains BLOCK IDs indicates that BLOCK IDS may be removed from the BLOCK ID queue (see FIG. 5, A4, A5 and A6; note that RST1 reads out the cells stored in the memory locations serial number 0 to serial number N-1 via A6 upon receiving the SN number via A4 and A5 (i.e. A4 and A5 sends data path control serial number, thus is the data path control means); see col. 6, line 11 to col. 8, lines 20, see col. 9, lines 46 to col. 10, lines 9), and

e. reading a cell out of the cell memory (see FIG. 5, A6; a cell is read from the RST1 memory table) whenever the BLOCK ID of the memory block in which it is stored is removed from the BLOCK ID queue at step d; (see FIG. 5, A4 and A5; when serial number of the each cell is transmitted to the RST1 memory; see col. 9, lines 45-67).

Heiman'203 does not explicitly disclose first back pressure data indicates that BLOCK/cell may be removed from the BLOCK/cell queue, and refraining from removing

BLOCK from the BLOCK/cell queue when the first back pressure data indicates that BLOCK may not be removed from the BLOCK/cell queue.

However, the above-mentioned claimed limitations are taught by Wills'779. In particular, Wills'779 teaches

d. first back pressure data (see FIG. 6, backpressure signal or overfill signal; see col. 6, lines 31-35) indicates that BLOCKs/cells may be removed from the BLOCK/cell queue (see FIG. 6, input queue 23; see FIG. 6. backpressure control 14, control interface 19; see col. 5, lines 50 to col. 6, lines 35; note that when overfill backpressure signal is removed by the backpressure control 14, the input buffer resume the transmission, and it is clear that when the transmission is resumed, the cell/block are removed from the input buffer 23) and refraining from removing BLOCKs/cells from the BLOCK/cell queue when the first back pressure data indicates that BLOCKs/cells may not be removed from the BLOCK/cell queue (see col. 6, lines 5-31; when the overfill backpressure is received at the backpressure control 14 with regarding to congested input buffer 23, the cell transmission is disabled/refrained/stopped at the congested input buffer. Note that when cell transmission is disable, the cells/blocks are not removed for the input buffer 23).

e. reading a cell out of the cell memory whenever the BLOCKs/cells of the memory block in which it is stored is removed from the BLOCK/cell queue at step d (see col. 6, lines 31-35; note that when that when overfill backpressure signal is removed by the backpressure control 14, the input buffer resume the transmission, and it is clear that when the transmission is resumed. When the transmission is resumed, the cells are read out from the input buffer).

In view of this, having the system of Heiman'203 and then given the teaching of Wills'779, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Heiman'203, by providing a backpressure mechanism with overflow backpressure signal control backpressure control, as taught by Wills'779. The motivation to combine is to obtain the advantages/benefits taught by Wills'779 since Wills'779 states at col. 1, line 31 to col. 2, lines 5 that such modification would maximizes the speedy transmission of time-critical data and minimizes the loss of information-critical data by controlling the congestion).

Regarding claim 7, the combined system of Heiman'203 and Wills'779 discloses all aspected as claimed limitation as described above in claim 6 above. Heiman'203 further discloses

f. writing cells read out of the cell memory into first buffer means (see FIG. 5, Output Buffer, OB, FIFO) for storing and reading out cells (see FIG. 5, cell out; the stored cells in OB FIFO is read and forwarded/outputted/transmitted; see col. 7, lines 25-32),

g. reading the cells out of the first buffer means (see FIG. 5, cell out; the stored cells in OB FIFO is read and forwarded/outputted/transmitted; see col. 7, lines 25-32), and

h. setting the first back pressure data to indicate that BLOCK may not be removed from the BLOCK queue whenever a number of cells stored in the first buffer means rises above a threshold level (see col. 6, lines 5-31; when the overfill backpressure is received at the backpressure control 14 with regarding to congested input buffer 23, the cell transmission is disabled/refrained/stopped at the congested input buffer. Note that when cell transmission

is disable, the cells/blocks are not removed for the input buffer 23. Note that the output buffer is congested/fill when the fill or congested level in the output buffer is above/more than predefined level), and

setting the first back pressure data to indicate that BLOCKs may be removed from the BLOCK queue whenever the number of cells stored in the first buffer means falls below the threshold level (see FIG. 6. backpressure control 14, control interface 19; see col. 5, lines 50 to col. 6, lines 35; note that when overfill backpressure signal is removed by the backpressure control 14, the input buffer resume the transmission, and it is clear that when the transmission is resumed, the cell/block are removed from the input buffer 23, when the output buffer is no longer congested/fill the output buffer congested/fill level is below predefined level).

In view of this, having the system of Heiman'203 and then given the teaching of Wills'779, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Heiman'203 as taught by Wills'779, for the same purpose and motivation as described above in claim 5.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heiman'203 and Wills'779, as applied to claim 3 above, and further in view of Chiussi (U.S. 5,689,500).

Regarding claim 4, the combined system of Heiman'203 and Wills'779 discloses all aspects of the claimed invention set forth in the rejection of Claim 1-3 as described above.

Neither Heiman'203 nor Wills'779 explicitly discloses second buffer means storing cells read out and for thereafter forwarding each cell it stores elsewhere in the network.

However, the above-mentioned claimed limitations are taught by Chiussi'500. In particular, Chiussi'500 teaches second buffer means (see FIG. 3, Cell Buffer 304 of ASX output module 1133, see FIG. 11) storing cells read out the first buffer means (see FIG. 3, Cell Buffer 304 of ASX input module 1131, see FIG. 11; note that ASX output cell buffer 304 receives the transmitted/read-out cells from ASX input cell buffer stores the cells in its cell buffer 304) and for thereafter forwarding each cell it stores elsewhere in the network (see FIG. 3, output port 402 of ASX of output module 1133 forwards the stored cells to the network); see col. 3, lines 1 to col. 4, lines 5).

In view of this, having the combined system of Heiman'203 and Wills'779, then given the teaching of Chiussi'500, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Heiman'203 and Wills'779, by providing the a output cell buffer which transmits to the network with backpressure mechanism, as taught by Chiussi'500. The motivation to combine is to obtain the advantages/benefits taught by Chiussi'500 since Chiussi'500 states at col. 1, line 20-60 that such modification would avoid the congestion that occurs when delays in one output port affects the traffic destined to other output.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heiman'203 in view of Fan (U.S. 6,324,165).

Regarding claim 9, Heiman'203 discloses method for receiving and storing cells derived from data transmissions conveyed on a network, and for then forwarding the cells elsewhere in the network (see FIG. 1, ATM switch and its transmission on the ATM

network), wherein each cell is identified as belonging to one of a plurality flows (see FIG. 2 and 3, each cell is identified by its VPI/VPI (i.e. ICI) number for each connection/flow and RIU is inserted according to its VP/VC connection/flow), wherein each flow has defined minimum and maximum forwarding rates (see FIG. 1, ATM switch, note that ATM connection/flow has various rates (i.e. CBR, VBR, and ABR, etc), wherein each flow is assigned to one of virtual output queue (VOQ) (see FIG. 5, the connection/flow is assigned to FIFO Output buffer which contains virtual output queue), the method comprising the steps of;

a. sequentially receiving and writing the cells into separate blocks of a cell memory (see FIG. 5, RST1, Resequening Memory Table 1; note that RST1 sequentially receives and stores the cell in sequential order in separate memory location/blocks (i.e. ECI0 to ECIk-1 row, and 0 to N-1 column memory block), wherein each memory block identified by a unique identification number (BLOCK ID) (see FIG. 5, serial number SN, 0 to N-1, is the column location number in the memory; see col. 7, lines 3-40);

b. for each flow for which cells identified as belonging thereto are currently stored in the cell memory (see FIG. 5, ECI_B, each cell flow/connection ID is stored in FIFO EC_B, and the RST1 stores the cells where each cell belongs to each flow/connection ID stored in the ECI_B FIFO; see col. 7, lines 16-55), generating (see FIG. 5, Check Unit CU) a sequence of BLOCK IDs of memory blocks currently storing cells; see FIG. 5, SN0, SN1,... and ECI0, ECI1,....; note that the sequence number from CU is sequentially stores by the serial numbering unit; see col. 7, lines 15-41); generating BLOCK IDs of memory blocks storing such cells at rate bounded by that flow's forwarding rates and (see FIG. 5, ECI_B FIFO and

CU; note that that the SN numbers and connection ID are generated by ECI_B and CU. Each ID or number defines the VP/VP flow rate for each stored cell; see col. 6, lines 10 to col. 7, lines 42),

c. establishing a separate BLOCK ID queue (see FIG. 5, the combined system maintains a serial number queue/table T2) corresponding of the VOQ (see FIG. 5, Output Buffer OB FIFO);

d. adding each generated BLOCK ID generated at step b to a BLOCK ID queue (see FIG. 5, the combined system maintains a serial number queue/table T2; see FIG. 5, each SN number generated by the CU is added to the numbering queue/table T2) corresponding to the VOQ to which it is assigned the flow of a cell stored in a memory block identified by the generated BLOCK ID (note that T2 stores the cell in sequential order in memory location/blocks (i.e. ECI0 to ECIk-1 and SN0 to SN1 column memory block) and its corresponding flow connection ID is stored in FIFO ECI_B).

f. for each VOQ, BLOCK IDs may be removed from the corresponding BLOCK ID queue, successively removing BLOCK IDS from the corresponding BLOCK ID queue in an order in which they were added to the BLOCK ID queue (see FIG. 5, A4, A5 and A6; note that RST1 reads out the cells stored in the memory locations serial number 0 to serial number N-1 via A6 upon receiving the SN number via A4 and A5 (i.e. A4 and A5 sends data path control serial number, thus is the data path control means); see col. 6, line 11 to col. 8, lines 20, see col. 9, lines 46 to col. 10, lines 9);

h. reading a cell out of the cell memory whenever the BLOCK ID of the memory block in which the cells is stored is removed from any BLOCK ID queue at step f (see FIG.

5, A4 and A5; when serial number of the each cell is transmitted to the RST1 memory; see col. 9, lines 45-67).

Heiman'203 does not explicitly disclose plurality of virtual output queues (VOQs)

b. storing such cells at rate bounded by that flow's defined minimum and maximum forwarding rates

e. for each VOQ providing corresponding first backpressure data indicating whether BLOCK/cell may or may not be removed from the BLOCK/cell queue corresponding to the VOQ;

g. for each VOQ, whenever the corresponding first back pressure data indicates BLOCK/cell may be not be removed from the corresponding BLOCK/cell queue, refraining from removing BLOCK IDS from the corresponding BLOCK ID queue; and

However, the above-mentioned claimed limitations are taught by Fan'165. In particular, Fan'165 teaches plurality of virtual output queues (VOQs) (see FIG. 3, CBR, rt_VBR, ABR, UBR queues in the output module 31),

b. for each flow (see FIG. 3, CBR, rt_VBR, ABR, UBR flow rates at input module 30) generating BLOCK/cell of memory blocks storing such cells at rate bounded by that flow's defined minimum and maximum forwarding rates (see FIG. 3, note that rt_VBR, ABR, UBR cell are bounded by the flow's predefined max and min (i.e. fixed and variable) rate; see col. 6, lines 20 to col. 7, lines 6),

d. adding each BLOCK/cell generated step b to a BLOCK/cell queue (see FIG. 3, Input module queue (i.e. CBR, ABR,...)) corresponding to the VOQ to which is assigned the

flow of a cell stored (see FIG. 3, the input queue stores the each flow of the cell; see col. 6, lines 56 to col. 7, lines 1-9),

e. for each VOQ providing corresponding first back pressure data (see FIG. 3, DRC rate feedback signal) indicating whether BLOCK/cell may or may not be removed from the BLOCK queue corresponding to the VOQ (see col. 7, lines 45 to col. 8, lines 50; note that DRC feedback signal indicates whether cell may or may not be removed and sent from the input queue (i.e. CBR, ABR,..) which corresponds to output queue (i.e. CBR, ABR,...));

f. for each VOQ, whenever the corresponding first back pressure data indicates BLOCK/cells may be removed from the corresponding BLOCK queue, successively removing BLOCK from the corresponding BLOCK queue (see col. 8, lines 9-67; note that the feedback signal with send RT or sent NRT indicates the cells may be removed from the corresponding input CBR and rt-VBR queue);

g. for each VOQ, whenever the corresponding first back pressure data indicates BLOCK IDS may be not be removed from the corresponding BLOCK queue, refraining from removing BLOCK from the corresponding BLOCK queue (see col. 8, lines 9-67; note that the feedback signal with stop RT or stop NRT indicates the cells may not be removed from the corresponding input CBR and rt-VBR queue).

In view of this, having the system of Heiman'203 and then given the teaching of Fan'165, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Heiman'203, by plurality of input and output CBR, rt-VBR, ABR and UBR queues with feedback control mechanism, as taught by Fan'165. The motivation to combine is to obtain the advantages/benefits taught by Fan'165

since Fan'165 states at col. 3, line 1-60 that such modification would provide controlling internal congestion and achieves fair throughput performance among competing flows at switch.

Regarding claim 10, the combined system of Heiman'203 and Fan'165 discloses all aspects of the claimed invention set forth in the rejection of Claim 9 as described above, and Heiman'203 discloses

i. storing each cell read out of the cell memory (see FIG. 5, RST1 memory) in first buffer means (see FIG. 5, Output Buffer, OB, FIFO; see FIG. 5, cell out; the stored cells in OB FIFO is read and forwarded/outputted/transmitted; see col. 7, lines 25-32);

j. reading the cells out of the first buffer means (see FIG. 5, cell out; the stored cells in OB FIFO is read and forwarded/outputted/transmitted; see col. 7, lines 25-32). Fan'165 teaches

k. for the VOQ, generating the corresponding first back pressure data,

wherein the first back pressure data indicates that BLOCK may be removed from the BLOCK queue corresponding to the VOQ when a number of cells of flows assigned to that VOQ stored in the first buffer means is below a first threshold level (see col. 8, lines 1-67; note that the cells are removed and transmitted from the input buffer which corresponds to output buffer when the output buffer fill threshold is less than the threshold value), and

wherein the first back pressure data indicates that BLOCK may no be removed from the BLOCK queue corresponding to the VOQ when a number of cells of flows assigned to that VOQ stored in the first buffer means is above the first threshold level (see col. 8, lines 1-

67; note that the transmission of cells are stop, from the input buffer which corresponds to output buffer, when the output buffer fill threshold is greater than the threshold value).

In view of this, having the system of Heiman'203 and then given the teaching of Fan'165, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Heiman'203, as taught by Fan'165, for the same motivation as stated above in Claim 9.

Allowable Subject Matter

8. Claims 8, 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
9. Claim 5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 571-272-3085. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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BRIAN NGUYEN
PRIMARY EXAMINER